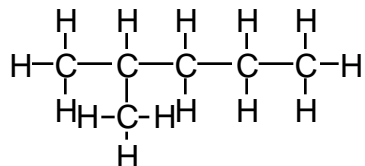


Name(s) \_\_\_\_\_

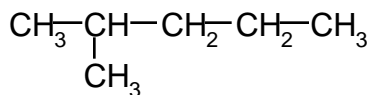
**eChem - PART III REPRESENTATIONS IN CHEMISTRY**

There are several ways to represent molecules. You can use chemical formulas, Lewis structures, or virtual 3-D models in eChem. These representations are like the language of chemistry; chemists use them to communicate with each other. In this activity, you will learn about these different representations of chemical compounds and transform organic compounds from one representation to another.

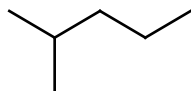
1. There are four representations below, and all of them represent the same molecule.



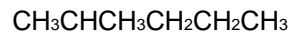
(a) structural formula



(b) condensed structural structure



(c) wireframe



(d) very condensed structural formula

A. Name the compound following the IUPAC rules.

B. Compare the difference between these representations:

In (a), carbon is represented as \_\_\_\_\_, hydrogen as \_\_\_\_\_, and single bond as \_\_\_\_\_.

In (b):

CH<sub>3</sub> is shorthand notation for:

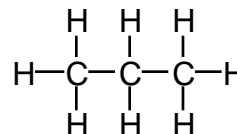
CH<sub>2</sub> is shorthand notation for:

In (c), how is carbon presented?

2. Draw three other representations of propane below.

(a) Structural formula

(b) simplified structural structure



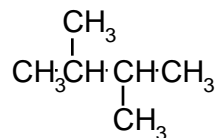
(c) wireframe

(d) very condensed structural formula

3-Representations in chemistry

Name(s) \_\_\_\_\_

3. Name the compound below and draw three other representations of the molecule below.



4. Use eChem and draw the molecules in questions 1, 2 and 3.  
(Remember to save your molecules and add .alc to file name for credit)

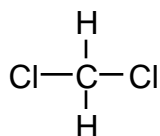
5. What is the chemical name of your toxin?
6. Use two different representations to draw your toxin molecule.
7. Construct your toxin in eChem and save it.
8. If molecular structures can be represented on paper, why do we need eChem to create three-dimensional models?

Name(s) \_\_\_\_\_

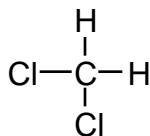
Compare each pair of compounds in questions 9, 10, and 11. Are they the same or different?

9. Are they the same or different?

(a) Look at these two molecules carefully and choose your answer.



compound A



compound B

They are exactly the same molecule.

They are different molecules.

(b) Name compound A and B

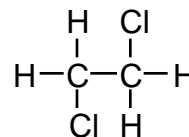
A: \_\_\_\_\_ B: \_\_\_\_\_

(c) Construct them on eChem, and then compare them by using "visualize".

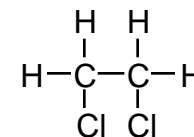
(d) Do they look different on eChem?

(e) Are they the same molecule or different molecules? How do you know that?

10. Use eChem and the ball-and-stick kits to build the molecules below.



compound C



compound D

(a) Name these two compounds.

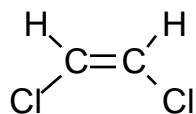
C: \_\_\_\_\_ D: \_\_\_\_\_

(b) Do they look the same or different in eChem?

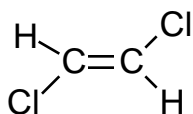
(c) Do these two ball-and-stick models look the same or different?

(d) Based on your answers of question (b) and (c), are they the same molecule or different molecules? How do you know that?

11. Use eChem and the ball-and-stick kits to build the molecules below.



compound E



compound F

(a) Name these two compounds.

E: \_\_\_\_\_

F: \_\_\_\_\_

(b) Do they look different or the same in eChem?

(c) Do two ball-and-stick models look different or the same?

(d) Based on your answers of question (b) and (c), are they the same or different molecules? How do you know that?

12. Compared with building models by using ball-and-stick kits, what are advantages and disadvantages of constructing models in eChem?